

I claim:

1. An energy management system comprising:
 - a longitudinally extending beam having a front face, a first side wall and a second side wall;
 - the first side wall having a first U-shaped section spaced from the front face; and
 - the second side wall having a second U-shaped section spaced from the front face;
 - wherein the first side wall rolls to enlarge the first U-shaped section and the second side wall rolls to enlarge the second U-shaped section during an impact force directed against the front face of the beam.
2. The energy management system of claim 1, further including:
 - an energy absorber located adjacent the front face of the beam.
3. The energy management system of claim 1, wherein:
 - the beam includes a front beam portion and a rear beam portion.
4. The energy management system of claim 3, wherein:
 - the front beam portion and the rear beam portion are integral.
5. The energy management system of claim 4, wherein:
 - the front beam portion and the rear beam portion have a uniform thickness.
6. The energy management system of claim 3, wherein:
 - the front face, the first side wall and the second side wall are on the front beam portion.
7. The energy management system of claim 3, wherein:
 - the front beam portion and the rear beam portion are mechanically connected.
8. The energy management system of claim 7, wherein:
 - a fastener mechanically connects the front beam portion to the rear beam portion.

9. The energy management system of claim 3, wherein:
the front beam portion and the rear beam portion are welded together.
10. The energy management system of claim 3, wherein:
a first one of the front beam portion and the rear beam portion includes a first pair of side flanges and a second one of the front beam portion and the rear beam portion includes a second pair of side flanges.
11. The energy management system of claim 10, wherein:
the second pair of side flanges are crimped over the first pair of side flanges to connect the front beam portion to the rear beam portion.
12. The energy management system of claim 10, wherein:
the first pair of side flanges and the second pair of side flanges are welded together.
13. The energy management system of claim 3, wherein:
the front beam portion is comprised of a first material and the rear beam portion is comprised of a second material; and
the first material is different than the second material.
14. The energy management system of claim 3, wherein:
the front face, the first side wall and the second side wall are on the front beam portion;
the rear beam portion includes a first side leg and a second side leg; and
the first side leg of the rear beam portion overlaps the first side wall of the front beam portion and the second side leg of the rear beam portion overlaps the second side wall of the front beam portion.

15. The energy management system of claim 1, wherein:
the first side wall and the second side wall each include a plurality of ribs to strengthen the first side wall and the second side wall to prevent buckling of the first side wall and the second side wall during the impact force directed against the front face of the beam.
16. The energy management system of claim 1, wherein:
the first U-shaped section and the second U-shaped section extend outwardly.
17. An energy management system comprising:
a longitudinally extending beam having a front face, a first side wall and a second side wall;
an energy absorber located adjacent the front face of the beam; and
mounts engaging a rear of the beam for connecting the beam to a vehicle;
the first side wall having a first U-shaped section spaced from the front face; and
the second side wall having a second U-shaped section spaced from the front face;
wherein the first side wall rolls to enlarge the first U-shaped section and the second side wall rolls to enlarge the second U-shaped section during an impact force directed against the front face of the beam.
18. The energy management system of claim 17, wherein:
the beam includes a front beam portion and a rear beam portion;
19. The energy management system of claim 18, wherein:
the front beam portion and the rear beam portion are integral.
20. The energy management system of claim 19, wherein:
the front beam portion and the rear beam portion have a uniform thickness.
21. The energy management system of claim 18, wherein:
the front face, the first side wall and the second side wall are on the front beam portion.

22. The energy management system of claim 18, wherein:
the front beam portion and the rear beam portion are mechanically connected.
23. The energy management system of claim 22, wherein:
a fastener mechanically connects the front beam portion to the rear beam portion.
24. The energy management system of claim 18, wherein:
the front beam portion and the rear beam portion are welded together.
25. The energy management system of claim 18, wherein:
a first one of the front beam portion and the rear beam portion includes a first pair of side flanges and a second one of the front beam portion and the rear beam portion includes a second pair of side flanges.
26. The energy management system of claim 25, wherein:
the second pair of side flanges are crimped over the first pair of side flanges to connect the front beam portion to the rear beam portion.
27. The energy management system of claim 25, wherein:
the first pair of side flanges and the second pair of side flanges are welded together.
28. The energy management system of claim 18, wherein:
the front beam portion is comprised of a first material and the rear beam portion is comprised of a second material; and
the first material is different than the second material.
29. The energy management system of claim 18, wherein:
the front face, the first side wall and the second side wall are on the front beam portion;
the rear beam portion includes a first side leg and a second side leg; and

the first side leg of the rear beam portion overlaps the first side wall of the front beam portion and the second side leg of the rear beam portion overlaps the second side wall of the front beam portion.

30. The energy management system of claim 17, wherein:

the first side wall and the second side wall each include a plurality of ribs to strengthen the first side wall and the second side wall to prevent buckling of the first side wall and the second side wall during the impact force directed against the front face of the beam.

31. The energy management system of claim 17, wherein:

the first U-shaped section and the second U-shaped section extend outwardly.

32. An energy management system comprising:

a longitudinally extending beam including a first beam portion and a second beam portion, a first one of the first beam portion and the second beam portion having a first face, a first side wall and a second side wall, a second one of the first beam portion and the second beam portion having a second face;

the first side wall having a first U-shaped section spaced from the first face; and

the second side wall having a second U-shaped section spaced from the first face;

wherein the first side wall rolls to enlarge the first U-shaped section and the second side wall rolls to enlarge the second U-shaped section during an impact force directed against the first face of the first beam portion or the second face of the second beam portion.

33. The energy management system of claim 32, wherein:

the first one of the first beam portion and the second beam portion is the first beam portion;

the second one of the first beam portion and the second beam portion is the second beam portion; and

the first side wall rolls to enlarge the first U-shaped section and the second side wall rolls to enlarge the second U-shaped section during an impact force directed against the first face of the first beam portion.

34. The energy management system of claim 33, further including:
an energy absorber located adjacent the front face of the first beam portion.
35. The energy management system of claim 32, wherein:
the first beam portion and the second beam portion are integral.
36. The energy management system of claim 32, wherein:
the first beam portion and the second beam portion have a uniform thickness.
37. The energy management system of claim 32, wherein:
the front face, the first side wall and the second side wall are on the first beam portion.
38. The energy management system of claim 32, wherein:
the first beam portion and the second beam portion are mechanically connected.
39. The energy management system of claim 38, wherein:
a fastener mechanically connects the first beam portion to the second beam portion.
40. The energy management system of claim 32, wherein:
the first beam portion and the second beam portion are welded together.
41. The energy management system of claim 32, wherein:
the first beam portion includes a first pair of side flanges and the second beam portion includes a second pair of side flanges.

42. The energy management system of claim 41, wherein:
the second pair of side flanges are crimped over the first pair of side flanges to connect
the first beam portion to the second beam portion.
43. The energy management system of claim 41, wherein:
the first pair of side flanges and the second pair of side flanges are welded together.
44. The energy management system of claim 32, wherein:
the first beam portion is comprised of a first material and the second beam portion is
comprised of a second material; and
the first material is different than the second material.
45. The energy management system of claim 32, wherein:
the front face, the first side wall and the second side wall are on the first beam portion;
the second beam portion includes a first side leg and a second side leg; and
the first side leg of the second beam portion overlaps the first side wall of the first
beam portion and the second side leg of the second beam portion overlaps the second side wall
of the first beam portion.
46. The energy management system of claim 32, wherein:
the first side wall and the second side wall each include a plurality of ribs to strengthen
the first side wall and the second side wall to prevent buckling of the first side wall and the
second side wall during the impact force directed against the first face of the first beam portion
or the second face of the second beam portion.
47. The energy management system of claim 32, wherein:
the first U-shaped section and the second U-shaped section extend outwardly.